

G1 Observations of Ganymede by Galileo NIMS

H.H. Kieffer, W.M. Calvin, L.A. Soderblom, J. Torson (U. S. Geological Survey), the NIMS Team, PI-R.W. Carlson, J. Hui (JPL)

The first Galileo close encounter with Ganymede occurred in June and the second will occur in early September. High spatial and spectral resolution coverage of the satellite is a priority in each of these first two orbits. Initial observations include global coverage at 228 wavelengths and an approximate spatial resolution of 100km. High-spatial resolution (10 to 20km) observations of targeted areas include the bright- and dark-rayed craters, polar regions, and the Memphis Facula region.

We currently have low spatial resolution global data in hand, in addition to observations of the bright-rayed crater Amon. Initial analysis show that bright regions exhibit all the spectral features of water ice including the temperature dependent $1.65\mu\text{m}$ feature. Dark areas show the signature of hydrated minerals by skewing the appearance of the $1.5\mu\text{m}$ water ice absorption. Weak features in the region from 2 to $2.5\mu\text{m}$ are suggested. Initial simple calculations show that small amounts of hydrated minerals, such as montmorillonite and alunite, are consistent with the data, though no absolute mineral identifications have yet been made.

The global sequence is centered near 10S, 180W. Several spectral units can be distinguished based upon short-wave albedo, relative strength of H_2O -ice bands, sharpness and asymmetry within bands (particularly at 1.6 and $2.0\mu\text{m}$), and the slope over 2.3 - $2.7\mu\text{m}$. About 6 units can be mapped. H_2O bands are strongest in the rays around Osiris, and weakest in central Galileo Regio, as anticipated from their visible albedo. Compared to their shortwave ($0.7\mu\text{m}$) reflectance, Galileo Regio and the dark area near 20S, 80W become relatively bright beyond $2.1\mu\text{m}$.

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Paper presented by Hugh H. Kieffer
U. S. Geological Survey
2255 N. Gemini Dr.

Flagstaff AZ 86001 USA
Phone: 520-556-7015
Fax: 520-556-7014
Email: hkieffer@flagmail.wr.usgs.gov

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